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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/771,876	01/29/2001	Chunshan Song	38,058	9020

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BP Amoco Corporation
Docket Clerk, Law Department, M.C. 2207A
200 East Randolph Drive
Chicago, IL 60601-7125

EXAMINER

ILDEBRANDO, CHRISTINA A

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 12/19/2002

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .		Applicant(s)	
	09/771,876		SONG ET AL.	
	Examin r		Art Unit	
	Christina Ildebrando		1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 28-38 and 41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23,25,26,39,40 and 42-44 is/are rejected.
- 7) ☒ Claim(s) 24 and 27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>9</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-27, 39-40, and 42-44, in Paper No. 12 is acknowledged.
2. Claims 28-38 and 41 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 12.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claim 10 recites the limitation "selected from the group consisting of binders comprising boehmite, alkali earth metals, and SiO₂." It appears that applicant intends to recite a group of binders in Markush format. The recitation "comprising" renders the claim indefinite because applicant has not set forth a genus expressed as a group consisting of certain specified materials, as required by Markush practice. Therefore, the scope of the claim is not clear. Refer to MPEP 2173.05(h).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-10, 21-22, and 42 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwamoto et al.

Iwamoto et al. (US 5,207,893) discloses a catalyst composition useful in hydrocracking processes. The catalyst composition comprises an 10-90% of an iron-containing crystalline aluminosilicate and 90-10% by weight of an inorganic binder (column 2, lines 50-55). Iwamoto et al. teaches that iron is contained in the zeolite in two forms: as deposited iron (referred to as inactive iron) and iron contained within the framework of the zeolite (column 3, lines 5-25). It is taught that the inactive iron content is not more than 35%, preferably not more than 35% by weight (column 3, lines 30-40). Suitable iron containing aluminosilicates include zeolite Y (column 4, lines 15-20). Suitable binders include boehmite gel and silica (column 6, lines 1-8). Iron containing aluminosilicates having an Fe/Al of 0.69, 0.89, 0.91, 0.84, and 0.82 are exemplified (columns 9-10, Table 1). Iwamoto et al. teaches that the iron containing aluminosilicate is prepared by contacting a zeolite such as zeolite Y with an iron salt in the presence of a mineral acid to incorporate the iron into the zeolite framework (column 2, lines 40-45 and column 5, lines 1-50). With reference to the examples, note that the initial silica to alumina ratio increases following the treatment with the mineral acid and iron salt, which means that iron is substituted for alumina which has been removed from the framework.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Iwamoto et al.

8. Claims 1, 3, 5-6, 9-12, 14, 16-18, and 20-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al.

Suzuki et al. (US 4,994,254) discloses a crystalline aluminogallosilicate useful in the preparation of a high octane gasoline. It is taught that the aluminogallosilicates preferably have an $\text{Al}_2\text{O}_3/\text{Ga}_2\text{O}_3$ ratio in the range of 2-4, which corresponds to an Ga/Al ratio of 0.25-0.5 (column 5, lines 5-10). Most preferable silicates are of the MFI type (column 5, lines 10-15). It is taught that the aluminogallosilicates may be formed into various shapes using alumina or silica binders (column 5, lines 45-55). The composition may further include an active metal such as palladium or platinum in an amount in the range of 0.1-10% by weight (column 6, lines 15-25).

The process limitation in claim 5 is noted, i.e. isomorphic substitution of the metal for Al. However, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324. In this case, the reference teaches an aluminosilicate composition which incorporated gallium into the zeolite framework, which is the same product as instantly claimed, despite the different method of production.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Suzuki et al.

9. Claims 1-8, 11, 13, 16-18, 21-23, 25, 26, and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Skeels et al.

Skeels et al. (US 5,098,687) discloses zeolite compositions which are topologically related to prior known zeolites but which are characterized as containing framework atoms of iron and/or titanium (column 1, lines 15-25). It is taught that the composition have a formula $(\Sigma_w\text{Al}_x\text{Si}_y)\text{O}_2$, wherein " Σ " represents at least one titanium and/or iron and w, x, and y represent the mole fractions of Σ , Al, and Si, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the trigonal compositional area defined by points A, B, and C:

Point	w	x	y
A	0.49	0.01	0.50
B	0.01	0.49	0.50
C	0.01	0.01	0.98

Refer also to Figure 1. This corresponds to a Σ/Al ratio of 0.02-49, which meets the ranges instantly claimed.

Skeels et al. teaches that a crystalline zeolite is contacted with an effective amount of a fluoro salt of titanium and/or iron whereby framework aluminum atoms of the zeolite are removed and replaced by titanium and/or iron atoms (column 5, lines 20-35). Suitable zeolites include zeolite Y, mordenite, zeolite L, zeolite, beta zeolite, and ZSM-5 (column 6, lines 1-15 and column 8, lines 30-50). Note also the examples which detail the preparation of iron-substituted zeolite Y, iron-substituted mordenite, iron-substituted zeolite L, and titanium-substituted ZSM-5, which have Fe/Al and Ti/Al ratios falling within the ranges instantly claimed. Skeels et al. teaches a washing post-

treatment to reduce the amount of salts in the zeolites (column 6, lines 35-55), which is considered to meet the deactivation step instantly claimed.

Skeels et al. teaches that the iron and/or titanium substituted zeolite compositions may be used as catalysts in various hydrocarbon conversion processes and may be combined with other known catalytic materials (column 45, lines 25-35). Specifically Skeels et al. teaches that substituted zeolites may be combined with Group VIII noble metals in amounts between about 3 and about 15 weight percent (column 48, lines 1-10).

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Skeels et al.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 19, 43, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skeels et al. as described above for claims 1-8, 11, 13, 16-18, 21-23, 25-26, and 39.

The teachings of Skeels et al. are applied as described above for claims 1-8, 11, 13, 16-18, 21-23, 25-26, and 39.

Skeels et al. does not specifically teach an iron-substituted ZSM-5. However, Skeels et al. suggests that either iron and/or titanium may be substituted into a zeolite such as ZSM-5 and further exemplifies a titanium substituted ZSM-5.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute iron in place of titanium in the ZSM-5 composition taught by Skeels et al. in light of the teaching by Skeels et al. that either titanium or iron may be used, suggesting that the use of iron is functionally equivalent to titanium.

12. Claims 9-10, 12, 14, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skeels et al. as applied to claims 1-8, 11, 13, 16-18, 21-23, 25-26, and 39 above, and further in view of either Farnos et al. or Absil et al.

The teachings of Skeels et al. are as described above for claims 1-8, 11, 13, 16-18, 21-23, 25-26, and 39 above.

Skeels et al. does not teach the use of a binder in combination with the metal substituted zeolite, as required by claims 9-10, 12, 14, and 20.

Farnos et al. (US 5,614,079) teaches that zeolite catalysts are often incorporated with a matrix or binder materials to impart strength during hydrocarbon conversion processes and that the most commonly used binder materials include alumina, clay, and silica (column 2, lines 60-69).

Absil et al. (US 4,837,397) teaches that in order to improve the physical strength of catalysts, the zeolite is formulated with a matrix or binder in order to improve its crushing strength and attrition resistance (column 5, lines 20-25). Suitable binders

include alumina, silica, and magnesia, which is employed in amounts in the range of about 5 to about 80 percent (column 5, lines 25-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the composition taught by Skeels et al. in light of the teaching by either Farnos et al. or Absil et al. that zeolite catalysts are conventional combined with binders in order to impart strength and improve the attrition resistance of the composition.

13. Claims 15 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Skeels et al. as applied to claims 1-8, 11, 13, 16-18, 21-23, 25-26, and 39 above, and further in view of either Farnos et al. or Absil et al., and Murray et al.

The teachings of Skeels et al. are as described above for claims 1-8, 11, 13, 16-18, 21-23, 25-26, and 39 above.

Skeels et al. does not teach the use of a binder, specifically a boehmite binder, in combination with an iron aluminosilicate, as required by claims 15 and 40.

Skeels et al. does not teach the use of a binder in combination with the metal substituted zeolite, as required by claims 9-10, 12, 14, and 20.

Farnos et al. (US 5,614,079) teaches that zeolite catalysts are often incorporated with a matrix or binder materials to impart strength during hydrocarbon conversion processes and that the most commonly used binder materials include alumina, clay, and silica (column 2, lines 60-69).

Absil et al. (US 4,837,397) teaches that in order to improve the physical strength of catalysts, the zeolite is formulated with a matrix or binder in order to improve its

crushing strength and attrition resistance (column 5, lines 20-25). Suitable binders include alumina, silica, and magnesia, which is employed in amounts in the range of about 5 to about 80 percent (column 5, lines 25-65).

Murray et al. (US 5,648,585) teaches that conventional alumina-containing binders known in the art include boehmite (column 6, lines 30-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the composition taught by Skeels et al. in light of the teaching by either Farnos et al. or Absil et al. that zeolite catalysts are conventional combined with binders in order to impart strength and improve the attrition resistance of the composition. One would have been further motivated to choose boehmite as the binder material in light of the teaching by Murray et al. that the use of such a binder is conventional and known in the catalyst art.

Allowable Subject Matter

14. Claims 24 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest a process for preparing an isomorphically substituted zeolite catalyst, wherein the refluxing is conducted in the presence of ammonium bifluoride, as required by claim 24, or wherein the soluble metal

compound is ferric fluoride, as required by claim 27, in combination with the other features instantly claimed.

Conclusion


16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Ildebrando whose telephone number is (703) 305-0469. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

CAI
December 15, 2002


TOM DUNN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700